

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

November 17, 2006

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 06-939
NLOS/GDM R2
Docket Nos. 50-280, 281
License Nos. DPR-32, 37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
ASME SECTION XI INSERVICE INSPECTION PROGRAM
REQUESTS FOR RELIEF CMP-001 REVISION 1

In letters dated December 12, 2002 (Serial No. 02-642) and August 25, 2003 (Serial No. 03-428), Virginia Electric and Power Company (Dominion) submitted Relief Requests CMP-001 for Surry Units 1 and 2, respectively. The requests were submitted to obtain relief from the Code examination requirements for the pressurizer surge line nozzle due to the difficulties involved with performing the examination. The NRC responded to Dominion's requests in letters dated August 26, 2003, for Surry Unit 1 and January 28, 2004, for Surry Unit 2 and requested significant additional information to support their review. As a result, Dominion withdrew the relief requests in letters dated December 5, 2003 (Serial No. 02-642A) and May 5, 2004 (Serial No. 03-428A) for Surry Units 1 and 2, respectively, and identified the intent to revise and resubmit the relief requests at a later date.

Accordingly, Dominion has revised the subject relief requests and hereby requests approval of Relief Requests CMP-001, Revision 1, pursuant to 10 CFR 50.55(a)(3)(ii) for Surry Power Station Units 1 and 2 for the fourth 10-year inservice inspection interval. The revised relief requests have been approved by the Station Nuclear Safety and Operating Committee and are included in Attachments 1 and 2 for Surry Units 1 and 2, respectively. In addition, Dominion's response to the NRC requests for additional information noted above is provided in Attachment 3.

Attachment 4 contains a Proprietary Information Notice and a Copyright Notice associated with the use of the Westinghouse proprietary information provided in Attachment 5. The Westinghouse proprietary information supports the revised relief requests and consists of pressurizer dimensional design information and a drawing of the pressurizer surge nozzle. The non-proprietary versions of the information and drawing are included with the relief requests in Attachments 1 and 2. Since Attachment 5 contains information proprietary to Westinghouse Electric Company LLC, it is supported by an affidavit signed by Westinghouse, the owner of the information. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations. Attachment 6

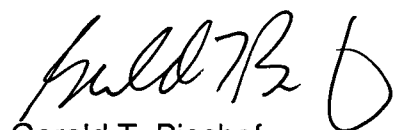
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contains the Westinghouse authorization letter CAW-04-1786 with accompanying affidavit. Accordingly, it is respectfully requested that the information proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR 2.390 of the Commission's regulations. Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse affidavit should reference CAW-04-1786 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P. O. Box 355, Pittsburgh, Pennsylvania 15230-0355. It should be noted that Westinghouse authorization letter CAW-04-1786 is dated January 30, 2004 and the accompanying affidavit is dated February 4, 2004; consequently, these documents reference regulation 10 CFR 2.790 regarding the requirements for withholding proprietary information as opposed to 10 CFR 2.390 which currently includes the requirements. Dominion requests that the NRC treat the information contained in Westinghouse authorization letter CAW-04-1786 and the accompanying affidavit pursuant to 10 CFR 2.390 (formerly 2.790).

It should also be noted that a recent industry operating experience report identified that a licensee had detected a degraded condition on their pressurizer nozzle to safe end welds. This condition is not pertinent to the inspection area of interest addressed in the Surry relief requests because the nozzle inner radius is physically remote from the area where the other licensee experienced cracking. The nozzle inner radius sections that are the subject of the Surry relief requests are not welds but cast carbon steel configurations clad with austenitic stainless steel. Neither of these materials is subject to primary water stress corrosion cracking (PWSCC), assuming the flaws identified by the other licensee are the result of PWSCC. Furthermore, the safe ends, nozzle to safe end welds, and safe end to piping welds on the Surry pressurizer surge, safety, spray, and relief nozzles are austenitic stainless steel materials and not subject to PWSCC, unlike the Alloy 82/182 materials on the other licensee's pressurizer nozzles. Regardless of the cause of the cracking found at the other licensee's facility, the circumferential orientation of the flaws, the different material types involved, and the difference in location (safe end weld versus nozzle inner radius) demonstrate there is no correlation between the events experienced by the other licensee and the Surry pressurizers.

If you have any questions or require additional information, please contact Mr. Gary D. Miller at (804) 273-2771.

Very truly yours,



Gerald T. Bischof
Vice President – Nuclear Engineering

Attachments

1. Relief Request CMP-001, Revision 1, Surry Unit 1
2. Relief Request CMP-001, Revision 1, Surry Unit 2
3. Response to Previous NRC Requests for Additional Information, Relief Requests CMP-001
4. Proprietary Information Notice and Copyright Notice
5. Proprietary Versions of Pressurizer Dimensional Design Information and Surry Units 1 and 2 Pressurizer Surge Nozzle (Cast Head Design) Drawing
6. Application for Withholding of Proprietary Information and Affidavit

Commitments made in this letter: None

cc: U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, Georgia 30303

Mr. N. P. Garrett
NRC Senior Resident Inspector
Surry Power Station

Mr. S. P. Lingam
NRC Project Manager
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 8G9A
Rockville, Maryland 20852

Mr. L. N. Olshan
NRC Project Manager
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 8-G9A
Rockville, Maryland 20852

Mr. R. A. Smith
Authorized Nuclear Inspector
Surry Power Station

Attachment 1

**Relief Request CMP-001 Revision 1
Surry Unit 1**

**Virginia Electric and Power Company
(Dominion)
Surry Power Station**

RELIEF REQUEST CMP-001 REVISION 1
SURRY POWER STATION UNIT 1

I. IDENTIFICATION OF COMPONENTS

Nozzle Inner Radius Section (Pressurizer Surge Nozzle)

| <u>Weld #</u> | <u>Component #</u> | <u>Drawing #</u> | <u>Class</u> |
|---------------|--------------------|-------------------|--------------|
| 23NIR | 1-RC-E-2 | 11448-WMKS-RC-E-2 | 1 |

II. APPLICABLE CODE EDITION AND ADDENDA

Surry Unit 1 is currently in the Fourth Inservice Inspection Interval under the 1998 Edition through the 2000 Addenda of the ASME Section XI Code.

III. CODE REQUIREMENTS

10 CFR 50.55a(xxi) mandates the 1998 Edition for Category B-D, Item B3.120. The 1998 Edition, Category B-D, Item B3.120 requires a volumetric examination of the nozzle inside radius section of the pressurizer surge nozzle. 10 CFR 50.55a(xxi) allows an enhanced visual VT-1 on the inside surface in lieu of the volumetric requirement, which can be performed from the outside surface.

IV. BASIS OF REQUEST FOR RELIEF

The Surry Unit 1 pressurizer surge line nozzle is integrally cast into the bottom head of the pressurizer. The nozzle is located under the pressurizer skirt and is surrounded by the 78 heater penetrations (Figure 1). Multi-layered, stainless steel mirror insulation and cables for the pressurizer heaters (Figure 2) obstruct access to the nozzle.

Removal of the insulation and cables would be difficult as well as labor and time intensive. The radiation exposure to the personnel involved in performing the associated work is a real and relevant concern. It is almost certain that some, and possibly all, heater cables would have to be disconnected so that the cables can be pulled back to allow access for removing insulation and performing the exam. It is also likely that some cable or heater damage would occur during this removal. If it is assumed that all seventy-eight (78) heater cables have to be disconnected and pulled back, the dose estimate for this work is 56 man-rem.

Other personnel safety concerns potentially involved with this examination include the increased risk for an unplanned exposure event and prevention of

contamination with personnel working in tight spaces between the surge line and the exposed portion of the pressurizer heaters. While actions would be taken to prevent any such events, the large dose rate gradients in the under-pressurizer area would challenge even the protection afforded by the best available technology. Temporary shielding is considered impractical in this regard because placement of the shielding material would obstruct and potentially preclude accessibility to the examination surface. Other issues include actual accessibility after removal of the various forms of interference and the likelihood of difficulties in replacing the insulation to its original configuration. Furthermore, the amount of examination coverage would be dependent on the overall accessibility obtained.

In conjunction with license renewal, Westinghouse performed an evaluation to address the impact of operational transients for SPS 1 to account for insurge/outsurge transients in addition to design transients in the pressurizer lower head. The results of the evaluation show that the Cumulative Usage Factor (CUF) for the nozzle inner radius is 0.29 (inside surface) and 0.11 (outside surface). Fatigue is one of the prominent degradation mechanisms and the cumulative usage factor (CUF) is an indicator of fatigue for which the ASME design limit is 1.0. The ASME limit of 1.0 on the usage factor is a design threshold and is not intended to be a limit on serviceability. The calculation of CUF is performed using the worst combinations of design transients, which are much more severe than actual operational transients. This introduces additional conservatism to the analysis. Thus, it can be said that the calculated CUF of 0.29 for all loading conditions including insurge/outsurge transients indicates that degradation due to fatigue is very small in the operating conditions. The environmental effects on fatigue were evaluated for the pressurizer surge line and the surge nozzle during license renewal application. It was determined that the surge line weld at the hot leg pipe connection will be inspected and used as the leading indicator for Environmentally Assisted Fatigue (EAF) concerns. The surge line weld at the hot leg pipe connection is included in augmented inspections as a part of our commitment for Aging Management. The results of these inspections and the results of planned research by the EPRI-sponsored Materials Reliability Program will be used to address and assess EAF for the surge nozzle. Dominion is unaware of any industry failure involving the inside radius section of the surge line nozzle in a Westinghouse design pressurizer.

There are several uncertainties regarding an alternative examination of the inside surface of the pressurizer surge line area by use of a remote visual tool. Such an examination requires that a boroscope be fed through the manway and down through openings in the heater support baffles. Adding to the difficulty in performing such an exam, there is a perforated basket diffuser covering the surge nozzle opening on the inside of the pressurizer (Figure 3). The boroscope would need to be positioned through the support plates, and then threaded through a perforation in the basket diffuser, if possible, to the pressurizer surge

line area. This examination will be partially obscured by the thermal sleeve, which extends beyond the inside radius area into the volume of the pressurizer. These obstructions would need to be overcome several times in order to achieve the required examination coverage. Furthermore, the resulting examination would be of the cladding that covers the inside radius of the nozzle, which is considered to be only marginally beneficial in determining the structural integrity of the nozzle. Additionally, performing the visual inspection requires opening the RCS and establishing access and foreign material exclusion controls. The boroscope itself has the potential to become lodged inside the perforated basket diffuser or behind a pressurizer heater support plate.

Any ultrasonic examination on this nozzle could only be described as "best effort." The limited benefit gained would not be commensurate with the difficulty and anticipated exposure estimate of 56 man-rem to perform this examination. An alternative examination employing a remote visual technology also has limited benefit as well as a limited probability of success. Therefore, Dominion concludes that this inspection effort and the associated significant potential risk are not commensurate with the limited benefit that may be obtained from the inspection. As such, we are applying for relief per 10 CFR 50.55a(a)(3)(ii) since compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.

V. PROPOSED ALTERNATIVE

The pressurizer surge line nozzle-to-vessel inner radius section will be VT-2 examined as part of the normally scheduled Class 1 system leakage test each refueling. In addition, the surveillance requirements of Technical Specifications that determine the reactor coolant system leak rate and the containment atmosphere radioactivity will be satisfied. The pressurizer surge line weld to the reactor coolant hot leg will be examined as part of augmented inspections to detect environmentally affected fatigue and will be used as the leading indicator of EAF. Furthermore, Dominion has an active Boric Acid Corrosion Control Program that identifies and monitors borated water leakage to prevent boric acid related degradation of the Reactor Coolant System. These programs ensure that the overall level of plant quality and safety will not be compromised.

VI. DURATION OF ALTERNATIVE

This relief request will be used for the fourth inservice inspection interval.

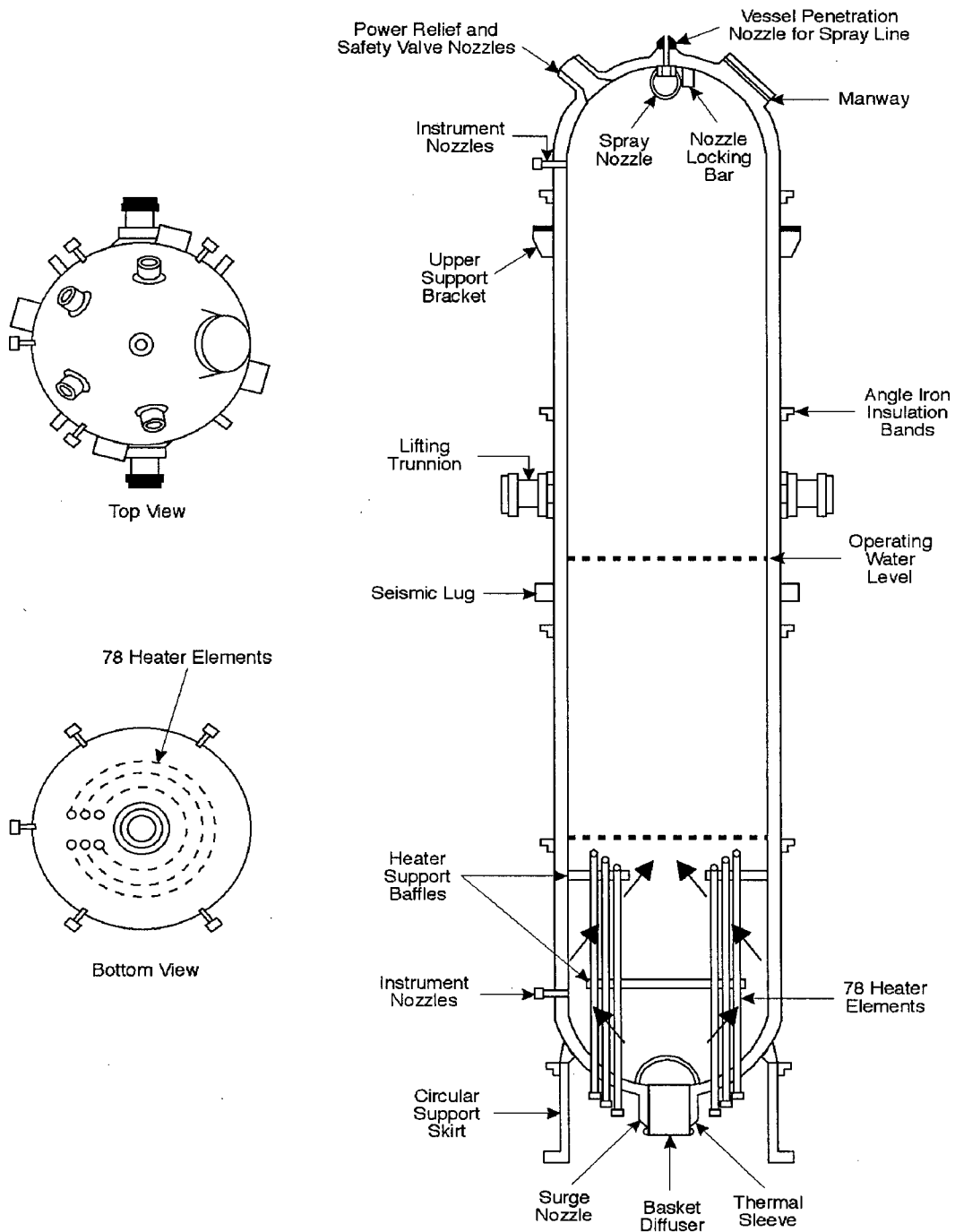
VII. PRECEDENTS

NRC letter dated February 18, 2005 granted similar relief for the fourth ten-year inservice inspection interval for Kewaunee Power Station. Relief was also granted for North Anna Power Station Unit 1 during the second and third

inservice inspection intervals (TAC Nos. M71066 and MA5750, respectively) and for North Anna Power Station Unit 2 for the second and third inservice inspection intervals (TAC Nos. M79147 and MB2280, respectively). Similar relief was also granted for Surry Power Station Units 1 and 2 for the third inservice inspection intervals (TAC Nos. M87312 and M89085, respectively). Byron Station Units 1 and 2 were also granted relief for the second inservice inspection intervals (TAC Nos. M94830 and M94831, respectively), and the Haddam Neck Plant was granted relief for the third inservice inspection interval (TAC No. M80457). Beaver Valley Power Station was also granted relief for their third inservice inspection interval in an NRC letter dated October 8, 1997.

VIII. REFERENCES

Dominion previously submitted this relief request with the Fourth Interval Inservice Inspection Program for Surry Unit 1 by letter dated December 12, 2002 (Serial No. 02-642) as Relief Request CMP-001. The relief request was withdrawn by Dominion letter dated December 5, 2003 (Serial No. 02-642A) with the expressed intent to resubmit. Dominion letter dated December 11, 2002 (Serial No. 02-754), *Listing of License Renewal Commitments*, and Dominion letter dated January 16, 2002 (Serial No. 01-686), discuss the commitment associated with the augmented inspection of the surge line to hot leg weld.



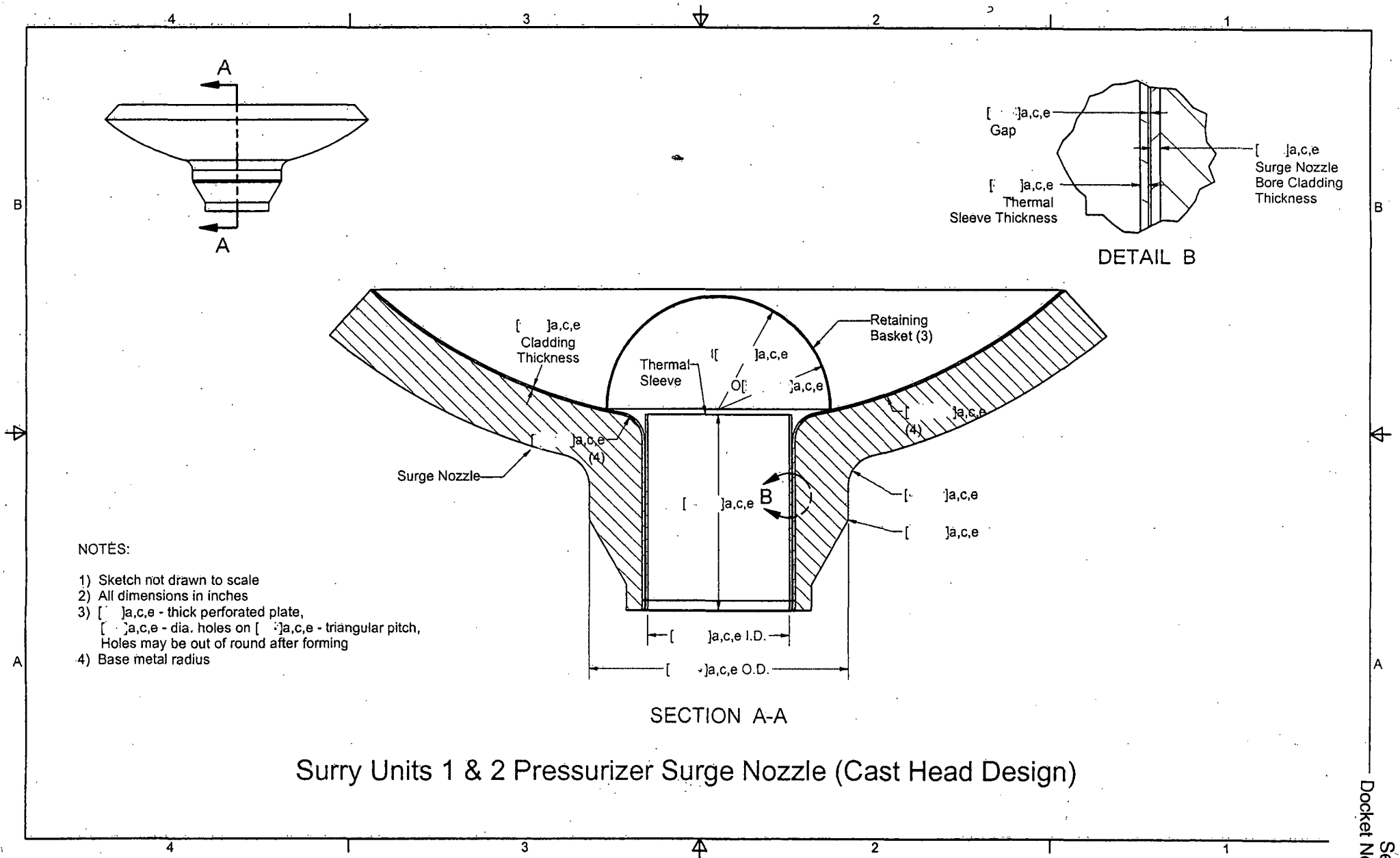
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PRESSURIZER

FIGURE 1



HEATER ELEMENTS/LAYERED INSULATION FIGURE 2



NOTES:

- 1) Sketch not drawn to scale
- 2) All dimensions in inches
- 3) [] a,c,e - thick perforated plate,
[] a,c,e - dia. holes on [] a,c,e - triangular pitch,
Holes may be out of round after forming
- 4) Base metal radius

SECTION A-A

Surry Units 1 & 2 Pressurizer Surge Nozzle (Cast Head Design)

Westinghouse Non-Proprietary Class 3
Attachment to VPA-04-5

Surry Units 1 and 2
Pressurizer Dimensional Design Information

Dominion has requested Westinghouse to provide dimensional and examination information related to the pressurizer surge nozzle inside radius for Surry Units 1 & 2. In response to this request, the following information is provided:

- A) The distance from the centerline of the innermost immersion heater to the edge of the surge nozzle is []^{a,c,e}.
- B) The original diameter of holes in the nozzle cover plate (retaining basket in Figure 1) prior to forming from a flat plate is []^{a,c,e}. Some holes may be out of round after the forming process.
- C) Figure 1 is the sketch detailing the inside nozzle radius section distances, and is provided as 'Sketch of Surry Units 1 & 2 Pressurizer Surge Nozzle (Cast Head Design)'.
- D) The space required for heater removal parallel to the surge nozzle is []^{a,c,e} below the bottom of the pressurizer support skirt. The distance necessary for heater removal perpendicular to the surge nozzle and below the bottom of the pressurizer support skirt is a []^{a,c,e} diameter circle around the centerline of the surge nozzle. The distance between the skirt floor and the lowest heater is []^{a,c,e}. The inner diameter for the pressurizer support skirt is approximately []^{a,c,e}.
- E) The nominal radius of curvature of the outside nozzle surface is []^{a,c,e}.
- F) Although Westinghouse was not the supplier of the insulation, references reviewed indicate that the insulation was to be []^{a,c,e} thick.
- G) At this time Westinghouse does not know of any successful visual examinations of the pressurizer surge nozzle inside radius with this design.

Based on the design inputs to create the sketch (Figure 1) in this document, unless the retaining basket was modified, or removed prior to installation in the pressurizer, it is Westinghouse's judgment that a remote visual examination of the surge nozzle inside radius surface would be extremely difficult to perform. The probe would have to be placed into the pressurizer through the manway access in the top of the pressurizer, and then lowered approximately []^{a,c,e}, with a transmission and power cable for a portable light source in tow, through the cut-outs of the two baffle plates, and then through a []^{a,c,e} diameter hole in the retaining basket to examine the surge nozzle inside radius. Unless the probe was readily controllable, the probe would have to be reinserted through the retaining basket holes numerous times, to examine the entire surge nozzle inside radius surface. It should also be noted that it is quite possible that the holes in the retaining basket may no longer be []^{a,c,e} in diameter since some holes are most likely out of round due to the retaining basket forming process, further complicating the visual inspection of the surge nozzle inside radius surface.

Attachment 2

**Relief Request CMP-001 Revision 1
Surry Unit 2**

**Virginia Electric and Power Company
(Dominion)
Surry Power Station**

RELIEF REQUEST CMP-001 REVISION 1
SURRY POWER STATION UNIT 2

I. IDENTIFICATION OF COMPONENTS

Nozzle Inner Radius Section (Pressurizer Surge Nozzle)

| <u>Weld #</u> | <u>Component #</u> | <u>Drawing #</u> | <u>Class</u> |
|---------------|--------------------|-------------------|--------------|
| 15NIR | 2-RC-E-2 | 11548-WMKS-RC-E-2 | 1 |

II. APPLICABLE CODE EDITION AND ADDENDA

Surry Unit 2 is currently in the Fourth Inservice Inspection Interval under the 1998 Edition through the 2000 Addenda of the ASME Section XI Code.

III. CODE REQUIREMENTS

10 CFR 50.55a(xxi) mandates the 1998 Edition for Category B-D, Item B3.120. The 1998 Edition, Category B-D, Item B3.120 requires a volumetric examination of the nozzle inside radius section of the pressurizer surge nozzle. 10 CFR 50.55a(xxi) allows an enhanced visual VT-1 on the inside surface in lieu of the volumetric requirement, which can be performed from the outside surface.

IV. BASIS OF REQUEST FOR RELIEF

The Surry Unit 2 pressurizer surge line nozzle is integrally cast into the bottom head of the pressurizer. The nozzle is located under the pressurizer skirt and is surrounded by the 78 heater penetrations (Figure 1). Multi-layered, stainless steel mirror insulation and cables for the pressurizer heaters (Figure 2) obstruct access to the nozzle.

Removal of the insulation and cables would be difficult as well as labor and time intensive. The radiation exposure to the personnel involved in performing the associated work is a real and relevant concern. It is almost certain that some, and possibly all, heater cables would have to be disconnected so that the cables can be pulled back to allow access for removing insulation and performing the exam. It is also likely that some cable or heater damage would occur during this removal. If it is assumed that all seventy-eight (78) heater cables have to be disconnected and pulled back, the dose estimate for this work is 56 man-rem.

Other personnel safety concerns potentially involved with this examination include the increased risk for an unplanned exposure event and prevention of

contamination with personnel working in tight spaces between the surge line and the exposed portion of the pressurizer heaters. While actions would be taken to prevent any such events, the large dose rate gradients in the under-pressurizer area would challenge even the protection afforded by the best available technology. Temporary shielding is considered impractical in this regard because placement of the shielding material would obstruct and potentially preclude accessibility to the examination surface. Other issues include actual accessibility after removal of the various forms of interference and the likelihood of difficulties in replacing the insulation to its original configuration. Furthermore, the amount of examination coverage would be dependent on the overall accessibility obtained.

In conjunction with license renewal, Westinghouse performed an evaluation to address the impact of operational transients for SPS 2 to account for insurge/outsurge transients in addition to design transients in the pressurizer lower head. The results of the evaluation show that the Cumulative Usage Factor (CUF) for the nozzle inner radius is 0.29 (inside surface) and 0.11 (outside surface). Fatigue is one of the prominent degradation mechanisms and the cumulative usage factor (CUF) is an indicator of fatigue for which the ASME design limit is 1.0. The ASME limit of 1.0 on the usage factor is a design threshold and is not intended to be a limit on serviceability. The calculation of CUF is performed using the worst combinations of design transients, which are much more severe than actual operational transients. This introduces additional conservatism to the analysis. Thus, it can be said that the calculated CUF of 0.29 for all loading conditions including insurge/outsurge transients indicates that the degradation due to fatigue is very small in the operating conditions. The environmental effects on fatigue were evaluated for the pressurizer surge line and the surge nozzle during license renewal application. It was determined that the surge line weld at the hot leg pipe connection will be inspected and used as the leading indicator for Environmentally Assisted Fatigue (EAF) concerns. The surge line weld at the hot leg pipe connection is included in augmented inspections as a part of our commitment for Aging Management. The results of these inspections and the results of planned research by the EPRI-sponsored Materials Reliability Program will be used to address and assess EAF for the surge nozzle. Dominion is unaware of any industry failure involving the inside radius section of the surge-line nozzle in a Westinghouse design pressurizer.

There are several uncertainties regarding an alternative examination of the inside surface of the pressurizer surge line area by use of a remote visual tool. Such an examination requires that a boroscope be fed through the manway and down through openings in the heater support baffles. Adding to the difficulty in performing such an exam, there is a perforated basket diffuser covering the surge nozzle opening on the inside of the pressurizer (Figure 3). The boroscope would need to be positioned through the support plates, and then threaded through a perforation in the basket diffuser, if possible, to the pressurizer surge

line area. This examination will be partially obscured by the thermal sleeve, which extends beyond the inside radius area into the volume of the pressurizer. These obstructions would need to be overcome several times in order to achieve the required examination coverage. Furthermore, the resulting examination would be of the cladding that covers the inside radius of the nozzle, which is considered to be only marginally beneficial in determining the structural integrity of the nozzle. Additionally, performing the visual inspection requires opening the RCS and establishing access and foreign material exclusion controls. The boroscope itself has the potential to become lodged inside the perforated basket diffuser or behind a pressurizer heater support plate.

Any ultrasonic examination on this nozzle could only be described as "best effort." The limited benefit gained would not be commensurate with the difficulty and anticipated exposure estimate of 56 man-rem to perform this examination. An alternative examination employing a remote visual technology also has limited benefit as well as a limited probability of success. Therefore, Dominion concludes that this inspection effort and the associated significant potential risk are not commensurate with the limited benefit that may be obtained from the inspection.

As such, we are applying for relief per 10 CFR 50.55a(a)(3)(ii) since compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.

V. PROPOSED ALTERNATIVE

The pressurizer surge line nozzle-to-vessel inner radius section will be VT-2 examined as part of the normally scheduled Class 1 system leakage test each refueling. In addition, the surveillance requirements of Technical Specifications that determine the reactor coolant system leak rate and the containment atmosphere radioactivity will be satisfied. The pressurizer surge line weld to the reactor coolant hot leg will be examined as part of augmented inspections to detect environmentally affected fatigue and will be used as the leading indicator of EAF. Furthermore, Dominion has an active Boric Acid Corrosion Control Program that identifies and monitors borated water leakage to prevent boric acid related degradation of the Reactor Coolant System. These programs ensure that the overall level of plant quality and safety will not be compromised.

VI. DURATION OF ALTERNATIVE

This relief request will be used for the 4th Inservice Inspection Interval.

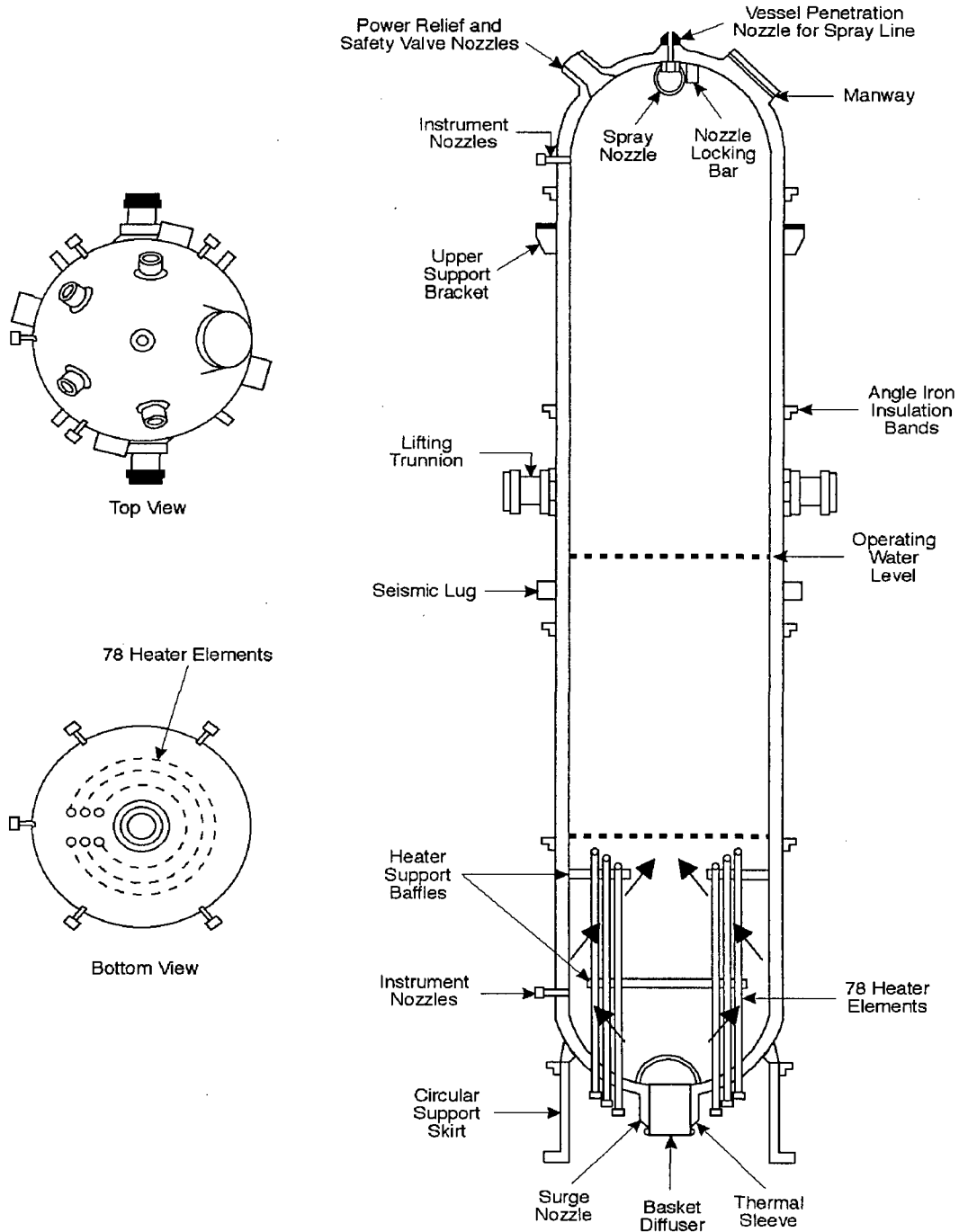
VII. PRECEDENTS

NRC letter dated February 18, 2005 granted similar relief for the fourth ten-year inservice inspection interval for Kewaunee Power Station. Relief was also granted for North Anna Power Station Unit 1 during the second and third

inservice inspection intervals (TAC Nos. M71066 and MA5750, respectively) and for North Anna Power Station Unit 2 for the second and third inservice inspection intervals (TAC Nos. M79147 and MB2280, respectively). Similar relief was also granted for Surry Power Station Units 1 and 2 for the third inservice inspection intervals (TAC Nos. M87312 and M89085, respectively). Byron Station Units 1 and 2 were also granted relief for the second inservice inspection intervals (TAC Nos. M94830 and M94831, respectively), and the Haddam Neck Plant was granted relief for the third inservice inspection interval (TAC No. M80457). Beaver Valley Power Station was also granted relief for their third inservice inspection interval in an NRC letter dated October 8, 1997.

VIII. REFERENCES

Dominion previously submitted this relief request with the Fourth Interval Inservice Inspection Program for Surry Unit 2 by letter dated August 25, 2003 (Serial No. 03-428) as Relief Request CMP-001. The relief request was withdrawn by Dominion letter dated May 5, 2004 (Serial No. 03-428A) with the expressed intent to resubmit. Dominion letter dated December 11, 2002 (Serial No. 02-754), *Listing of License Renewal Commitments*, and Dominion letter dated January 16, 2002 (Serial No. 01-686), discuss the commitment associated with the augmented inspection on the surge line to hot leg weld.



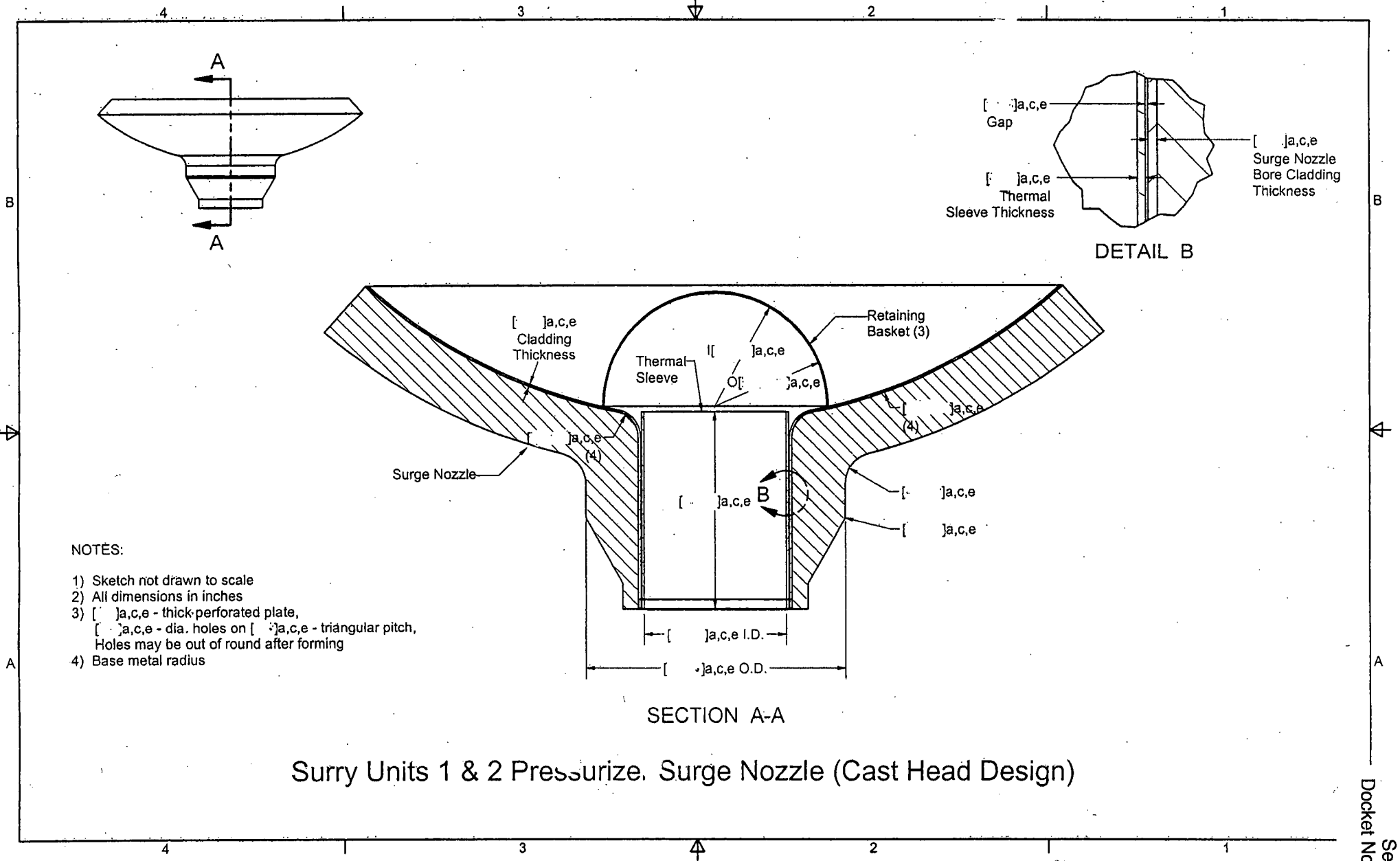
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PRESSURIZER

FIGURE 1



HEATER ELEMENTS/LAYERED INSULATION FIGURE 2



NOTES:

- 1) Sketch not drawn to scale
- 2) All dimensions in inches
- 3) [] a,c,e - thick-perforated plate,
[] a,c,e - dia. holes on [] a,c,e - triangular pitch,
Holes may be out of round after forming
- 4) Base metal radius

Surry Units 1 & 2 Pressurize. Surge Nozzle (Cast Head Design)

Westinghouse Non-Proprietary Class 3
Attachment to VPA-04-5

Surry Units 1 and 2
Pressurizer Dimensional Design Information

Dominion has requested Westinghouse to provide dimensional and examination information related to the pressurizer surge nozzle inside radius for Surry Units 1 & 2. In response to this request, the following information is provided:

- A) The distance from the centerline of the innermost immersion heater to the edge of the surge nozzle is []^{a,c,e}.
- B) The original diameter of holes in the nozzle cover plate (retaining basket in Figure 1) prior to forming from a flat plate is []^{a,c,e}. Some holes may be out of round after the forming process.
- C) Figure 1 is the sketch detailing the inside nozzle radius section distances, and is provided as 'Sketch of Surry Units 1 & 2 Pressurizer Surge Nozzle (Cast Head Design)'.
- D) The space required for heater removal parallel to the surge nozzle is []^{a,c,e} below the bottom of the pressurizer support skirt. The distance necessary for heater removal perpendicular to the surge nozzle and below the bottom of the pressurizer support skirt is a []^{a,c,e} diameter circle around the centerline of the surge nozzle. The distance between the skirt floor and the lowest heater is []^{a,c,e}. The inner diameter for the pressurizer support skirt is approximately []^{a,c,e}.
- E) The nominal radius of curvature of the outside nozzle surface is []^{a,c,e}.
- F) Although Westinghouse was not the supplier of the insulation, references reviewed indicate that the insulation was to be []^{a,c,e} thick.
- G) At this time Westinghouse does not know of any successful visual examinations of the pressurizer surge nozzle inside radius with this design.

Based on the design inputs to create the sketch (Figure 1) in this document, unless the retaining basket was modified, or removed prior to installation in the pressurizer, it is Westinghouse's judgment that a remote visual examination of the surge nozzle inside radius surface would be extremely difficult to perform. The probe would have to be placed into the pressurizer through the manway access in the top of the pressurizer, and then lowered approximately []^{a,c,e}, with a transmission and power cable for a portable light source in tow, through the cut-outs of the two baffle plates, and then through a []^{a,c,e} diameter hole in the retaining basket to examine the surge nozzle inside radius. Unless the probe was readily controllable, the probe would have to be reinserted through the retaining basket holes numerous times, to examine the entire surge nozzle inside radius surface. It should also be noted that it is quite possible that the holes in the retaining basket may no longer be []^{a,c,e} in diameter since some holes are most likely out of round due to the retaining basket forming process, further complicating the visual inspection of the surge nozzle inside radius surface.

Attachment 3

Response to Previous NRC Requests for Additional Information
Relief Requests CMP-001

Virginia Electric and Power Company
(Dominion)
Surry Power Station Units 1 and 2

Response to Previous NRC Requests for Additional Information
Relief Requests CMP-001
Surry Power Station Units 1 and 2

The following information is provided in response to the NRC's previous requests for additional information as indicated below:

NRC Question Received on August 26, 2003 for Surry Unit 1 Relief Request CMP-001

Question - "The licensee states that any ultrasonic examination of the pressurizer surge nozzle could only be described as "best effort". The licensee also states that remote visual technology has very little if any reasonable probability of success. The licensee made similar statements when requesting the same relief on the pressurizer surge nozzle for the third 10-year ISI interval. Given that ultrasonic testing examination techniques and technology as well as remote visual technology has improved greatly in the last 10 years, please explain what steps have been taken by the licensee in the past 10 years to try to improve the level of inspection on the pressurizer surge nozzle. The staff also requests detailed drawings that show cross sectional view of the surge nozzle, thermal sleeve, basket diffuser and material specification, as well as drawings that clearly show interference on the outside of the vessel. The drawings should include dimensions."

Response - Figure 3 in the relief requests included in Attachments 1 and 2 has been added to provide a detailed drawing of the surge line nozzle. Dimensions for the drawing are provided in the proprietary version included in Attachment 5. The lower pressurizer head and nozzle material is SA-216 Grade WCC cast carbon steel.

The technique for performing the ultrasonic examination on the outside surface and/or a remote visual examination on the inside surface of the surge nozzle is not a difficulty for this requirement. Accessibility to the surfaces is the actual hindrance. Dominion has revised the relief requests to emphasize that restricted access to the surfaces constitutes the hardship.

NRC Questions Received on January 28, 2004 for Surry Unit 2 Relief Request CMP-001

Question - "VEPCO stated that any ultrasonic examination of the pressurizer surge nozzle could only be described as "best effort," and that a remote visual examination, conducted from the inside of the pressurizer, has very little probability of success. Similar statements were made when requesting the same relief during previous inspection intervals. Given that advancements in ultrasonic testing and remote visual technologies have been made since the previous request, describe what steps have been taken by the licensee to improve the level of inspection for the pressurizer surge nozzle. In addition, provide detailed drawings that show cross-sectional views of the surge nozzle, thermal sleeve, and basket diffuser. The staff requests that these

drawings include a list of the material specifications, dimensions of the components, and clearly indicate the interferences on the outside of the vessel for performing ultrasonic examination."

Response - Figure 3 in the relief requests has been added to provide detailed drawings of the surge line nozzle. Dimensions for the drawing are provided in the proprietary version included in Attachment 5. The lower pressurizer head and nozzle material is SA-216 Grade WCC cast carbon steel.

The technique for performing the ultrasonic examination on the outside surface and/or a remote visual examination on the inside surface of the surge nozzle is not a difficulty for this requirement. Accessibility to the surfaces is the actual hindrance. Dominion has revised the relief requests to emphasize that restricted access to the surfaces constitutes the hardship.

Question - "VEPCO has provided a basis to support a determination of hardship; however, further information is needed in order for the NRC staff to arrive at reasonable assurance of continued structural integrity for this component. VEPCO states that the calculated cumulative usage factors for operational and design transients in the surge nozzle inner radius are 0.29 and 0.11, for inside and outside surfaces, respectively, and that these values are less than the design limit and provide insight into the potential for failure in this region. Please elaborate on what insights may be derived from the analyses, primarily from the point of view of expected degradation mechanisms and the probability of failure that these mechanisms present, based on operational considerations."

Response - The fourth paragraph under "IV. Basis of Request for Relief" has been expanded in the discussion of cumulative usage factor, failure mechanisms and augmented examination. The surge nozzle and the surge pipe line were analyzed for GSI-190 environmental effects during the license renewal application. It was determined that the surge nozzle inner radius did not require augmented examination for Aging Management. The analysis determined the pressurizer surge line to the reactor coolant hot leg weld is the leading indicator of Environmentally Assisted Fatigue (EAF) and will, therefore, receive augmented inspection and evaluation.

Question - "VEPCO has stated that the alternative to volumetric examinations will be the Code-required visual VT-2 examinations performed in conjunction with system leakage tests during each refueling outage. Please describe if any augmentation of the visual VT-2 examination will be employed specifically for the surge nozzle, if the Code-required volumetric examination is eliminated."

Response - Dominion does not plan to augment the present IWB-2500-1, Category B-P, Item B15.20 VT-2 examination. This exam, in conjunction with the following measures, is considered sufficient to ensure that the overall level of plant quality and

safety will not be compromised:

- 1) Technical Specification limitations and monitoring of the reactor coolant system leak rate,
- 2) Technical Specification monitoring of containment atmospheric particulate radioactivity,
- 3) Augmented inspection to detect EAF, and the
- 4) Boric Acid Corrosion Control Program to detect boric acid and to locate leakage sources.

Question - "VEPCO also states that Technical Specifications (TS) surveillance requirements related to reactor coolant leak rates and containment atmospheric radioactivity will be satisfied. However, based on recent industry events such as the primary coolant leak at VC Summer, it is unclear whether simply meeting TS is sufficient to indicate that a significant leak is occurring. Please describe any other alternatives the licensee has considered to indicate that a leak associated with the pressurizer surge nozzle may be occurring. In your response, specifically address whether VEPCO has considered any special instrumentation for this region for monitoring potential leakage from the pressurizer surge nozzle or for detecting the containment atmospheric radioactivity levels in the vicinity of the pressurizer surge nozzle."

Response - Dominion does not plan at this time to install any new instrumentation to detect leakage at this location; however, as stated in the relief requests under item "V. PROPOSED ALTERNATIVE", two new leakage and failure detection programs have been implemented - the Boric Acid Corrosion Control Program and the augmented inspection of the pressurizer surge line to the reactor coolant hot leg.

Attachment 4

Proprietary Information Notice and Copyright Notice

**Virginia Electric and Power Company
(Dominion)
Surry Power Station Units 1 and 2**

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.

Attachment 6

Application for Withholding of Proprietary Information and Affidavit

**Virginia Electric and Power Company
(Dominion)
Surry Power Station Units 1 and 2**



Westinghouse Electric Company
Nuclear Services
P.O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Direct tel: (412) 374-4643
Direct fax: (412) 374-4011
e-mail: greshaja@westinghouse.com

Our ref: CAW-04-1786

January 30, 2004

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: Submittal of "Pressurizer Dimensional Design Information" for Surry Units 1 and 2 (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-04-1786 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.790 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Dominion Generation.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-04-1786, and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Very truly yours,

A handwritten signature in black ink, appearing to read 'J. A. Gresham'.

J. A. Gresham, Manager
Regulatory Compliance and Plant Licensing

Enclosures

cc: D. Holland
B. Benney
E. Peyton

bcc: J. A. Gresham (ECE 4-7A) 1L
R. Bastien, 1L, 1A (Nivelles, Belgium)
C. Brinkman, 1L, 1A (Westinghouse Electric Co., 12300 Twinbrook Parkway, Suite 330, Rockville, MD 20852)
RCPL Administrative Aide (ECE 4-7A) 1L, 1A (letter and affidavit only)

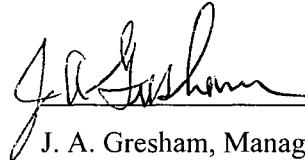
AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF ALLEGHENY:

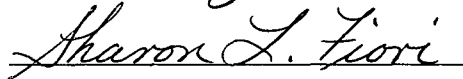
Before me, the undersigned authority, personally appeared J. A. Gresham, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:



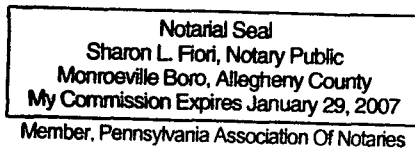
J. A. Gresham, Manager

Regulatory Compliance and Plant Licensing

Sworn to and subscribed
before me this 4th day
of February, 2004



Notary Public



- (1) I am Manager, Regulatory Compliance and Plant Licensing, in Nuclear Services, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.
- (2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.790 of the Commission's regulations and in conjunction with the Westinghouse "Application for Withholding" accompanying this Affidavit.
- (3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.
- (4) Pursuant to the provisions of paragraph (b)(4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
 - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.
 - (ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

 - (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
- (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.
- (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.
- (e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.
- (f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

- (a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.
- (b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.
- (c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

- (d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.
 - (e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.
 - (f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.790, it is to be received in confidence by the Commission.
- (iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.
- (v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in "Pressurizer Dimensional Design Information" for Surry Units 1 and 2 (Proprietary), being transmitted by the Dominion Generation letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted for use by Westinghouse for Surry Units 1 and 2 is expected to be applicable for other licensee submittals in response to certain NRC requirements for justification of pressurizer inspection relief request.

This information is part of that which will enable Westinghouse to:

- (a) Assist the customer to obtain NRC approval of the pressurizer inspection relief request.

Further this information has substantial commercial value as follows:

- (a) Westinghouse can sell the use of similar information to its customers for purposes of meeting NRC requirements for licensing documentation.
- (b) Westinghouse can sell support and defense of technical justification to support utility relief requests.
- (c) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar support documentation and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.